

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A fast roaming system comprising at least one mobile terminal and at least two access points,

wherein the at least one mobile terminal, while communicating over a wireless LAN with an access point of the at least two access points, serving as a parent station, can be quickly switched from the parent station to an adjacent access point of the at least two access points having an overlapping communication range;

wherein each of the at least two access points comprises:

a wireless LAN interface for communicating with the mobile terminal over the wireless LAN,

a roaming unit for performing a roaming operation,

a beacon transmitter for transmitting a beacon signal to provide synchronization with the mobile terminal, and

a data transmitter for transmitting, to the mobile terminal, access point data required for the roaming operation; and

wherein the mobile terminal comprises:

a wireless LAN interface for communicating with an access point over the wireless LAN,

an access point search unit for searching for peripheral connectable access points and for obtaining access point data,

a roaming execution unit for transferring the connection of the mobile terminal from a currently connected access point to another, designated access point,

an access point data table in which the access point data detected and obtained by the access point search unit are recorded, and

a function controller for, when a condition for communicating with the currently connected access point matches a predetermined roaming operation start condition, employing a predetermined order sequence to select one of the access points entered into the access point data table, and for driving the roaming unit to perform the roaming operation for the access point that is selected.

2. (original): A fast roaming system according to claim 1, wherein the mobile terminal provides a roaming order as the order condition for the access point that is recorded in the access point data table; and wherein, until a roaming process is completed, the function controller repeats the roaming process in the roaming order to sequentially select a roaming destination.

3. (previously presented): A fast roaming system according to claim 2, wherein the mobile terminal monitors a reception level of a wireless signal received from a connectable access point, stores the reception level to the access point data table, and sets the roaming order beginning with the highest reception level.

4. (currently amended): A fast roaming system according to claim 2, wherein the data transmitter of each of the at least two~~the access points~~~~point~~ transmits, to the mobile terminal, the number of mobile terminals connected to the access point; and wherein the access point search unit of the mobile terminal stores, in the access point data table, the number of

mobile terminals that is received, and sets the roaming order beginning with the smallest number of the mobile terminals connected to the access point.

5. (currently amended): A fast roaming system according to claim 2, wherein the data transmitter of each of the at least two~~the~~ access ~~points~~~~point~~ transmits, to the mobile terminal, an error ratio of data that are exchanged; and wherein the access point search unit of the mobile terminal stores the received error ratio in the access point data table, and sets the roaming order beginning with the lowest error ratio.

6. (currently amended): A fast roaming system according to claim 2, wherein the data transmitter of each of the at least two~~the~~ access ~~points~~~~point~~ transmits, to the mobile terminal, a communication ratio for a communication band of the access point; and wherein the access point search unit of the mobile terminal stores the received communication ratio in the access point data table, and sets the roaming order beginning with the lowest communication ratio.

7. (currently amended): A fast roaming system according to claim 2,
wherein the data transmitter of each of the at least two~~the~~ access ~~points~~~~point~~ transmits, to the mobile terminal, traffic data that include the number of mobile terminals connected to the access point, the error ratio of data that are exchanged, and the communication ratio for the communication band of the access point;

wherein the access point search unit of the mobile terminal stores the number of mobile terminals, the error ratio and the communication ratio in the access point data table; and

wherein the function controller of the mobile terminal adds predetermined weights to multiple entries in the access point data table, including the number of mobile terminals, the

error ratio and the communication ratio, obtains the sums for the individual access points, and sets the roaming order beginning with the smallest sum.

8. (original): A fast roaming system according to claim 1, wherein the mobile terminal further comprises:

a reception level area, in the access point data table, for which, during communication, reception levels of wireless signals received from the parent station that is an access point are monitored and stored sequentially at predetermined times;

a level comparator for comparing the reception level of each received wireless signal with reception levels in the past;

a counter for counting the times for comparison; and

a roaming start instruction unit for defining, as the predetermined roaming start condition, when the result of the comparison, the reception level is lowered continuously by the number of times that matches a predetermined count.

9. (original): A fast roaming system according to claim 8, wherein the mobile terminal further includes:

a roaming start instruction unit for comparing, with the reception levels of signals received from the connected parent station, a reception level of a wireless signal obtained by the access point search unit, and for defining, as the roaming start, when the reception level of the signal obtained by the access point search unit is a predetermined value or larger.

10. (original): A fast roaming system according to claim 1, wherein the mobile terminal further includes:

a roaming start instruction unit for extracting an error ratio included in a beacon signal received from the connected parent station, and storing the error ratio, and for defining, as the roaming start, when the error ratio is larger than a predetermined error ratio.

11. (currently amended): A fast roaming system according to claim 1, wherein the access point search unit of the mobile terminal obtains the end time of a contention-free period, which are included in both a beacon signal and a probe response; and wherein, the access point search unit searches for peripheral access points during a period except for a period where data are transmitted and received, after the contention-free period is over.

12. (currently amended): A fast roaming system according to claim 1, wherein one selected access point is located as a master parent station for transmitting a synchronized packet; and wherein the master parent station comprises:

a synchronized packet transmitter for transmitting, to another access point, a synchronized packet that is synchronized with a beacon signal transmitted by the master parent station; and wherein each of the other access points includes:

a synchronized packet receiver for receiving the synchronized packet; and a beacon transmitter for defining, as a reference time, the reception time for the synchronized packet, and for, after a predetermined time has elapsed following the reception of the reference time, transmitting a beacon signal ~~for each radio channel~~, without overlapping a beacon signal from another access point.

13. (original): A fast roaming system according to claim 12, wherein the access point search unit of the mobile terminal comprises:

a passive scanner for receiving a beacon signal and for searching for an access point; and

a beacon table, in which the correlation between a wireless channel and a beacon transmission time is recorded,

wherein the passive scanner performs the passive scanning at the time recorded in the beacon table, excluding the time whereat the mobile terminal is transmitting and receiving data.

14. (original): A fast roaming system according to claim 13, wherein the mobile terminal further comprises:

an active scanner for examining an access point from which a response is received relative to a search packet that the access point search unit has transmitted to the access point,

wherein, when the passive scanner fails to obtain the access point through passive scanning, the active scanner performs the active scanning.

15. (previously presented): A mobile terminal capable of performing fast roaming, wherein the mobile terminal, while communicating over a wireless LAN with an access point can be quickly switched from the access point with which there is communication to an adjacent access point having an overlapping communication range; and

wherein the mobile terminal comprises:

a wireless LAN interface for communicating with an access point over the wireless LAN,

an access point search unit for searching for peripheral connectable access points and for obtaining access point data,

a roaming execution unit for transferring the connection of the mobile terminal from a currently connected access point to another, designated access point,

an access point data table in which the access point data detected and obtained by the access point search unit are recorded, and

a function controller for, when a condition for communicating with the currently connected access point matches a predetermined roaming operation start condition, employing a predetermined order sequence to select one of the access points entered into the access point data table, and for driving the roaming unit to perform the roaming operation for the access point that is selected.

16. (previously presented): A mobile terminal according to claim 15, wherein the mobile terminal provides a roaming order as the order condition for the access point that is recorded in the access point data table; and wherein, until a roaming process is completed, the function controller repeats the roaming process in the roaming order to sequentially select a roaming destination.

17. (previously presented): A mobile terminal according to claim 16, wherein the mobile terminal monitors a reception level of a wireless signal received from a connectable access point, stores the reception level to the access point data table, and sets the roaming order beginning with the highest reception level.

18. (currently amended): A mobile terminal according to claim 16, wherein the mobile terminal receives from each of the access points~~point~~ the number of mobile terminals connected to the access point; and wherein the access point search unit of the mobile terminal stores, in the access point data table, the number of mobile terminals that is received, and sets the roaming order beginning with the smallest number of the mobile terminals connected to the access point.

19. (currently amended): A mobile terminal according to claim 16, wherein the mobile terminal receives from each of the access points~~point~~ an error ratio of data that are exchanged; and wherein the access point search unit of the mobile terminal stores the received

error ratio in the access point data table, and sets the roaming order beginning with the lowest error ratio.

20. (currently amended): A mobile terminal according to claim 16, wherein the mobile terminal receives from each of the access points~~point~~ a communication ratio for a communication band of the access point; and wherein the access point search unit of the mobile terminal stores the received communication ratio in the access point data table, and sets the roaming order beginning with the lowest communication ratio.

21. (currently amended): A mobile terminal according to claim 16, wherein the mobile terminal receives from each of the access points~~point~~ traffic data that include the number of mobile terminals connected to the access point, the error ratio of data that are exchanged, and the communication ratio for the communication band of the access point;

wherein the access point search unit of the mobile terminal stores the number of mobile terminals, the error ratio and the communication ratio in the access point data table; and

wherein the function controller of the mobile terminal adds predetermined weights to multiple entries in the access point data table, including the number of mobile terminals, the error ratio and the communication ratio, obtains the sums for the individual access points, and sets the roaming order beginning with the smallest sum.

22. (previously presented): A mobile terminal according to claim 15, wherein the mobile terminal further comprises:

a reception level area, in the access point data table, for which, during communication, reception levels of wireless signals received from a parent station that is an access point are monitored and stored sequentially at predetermined times;

a level comparator for comparing the reception level of each received wireless signal with reception levels in the past;

a counter for counting the times for comparison; and

a roaming start instruction unit for defining, as the predetermined roaming start condition, when the result of the comparison, the reception level is lowered continuously by the number of times that matches a predetermined count.

23. (previously presented): A mobile terminal according to claim 22, wherein the mobile terminal further includes:

a roaming start instruction unit for comparing, with the reception levels of signals received from a connected parent station, that is an access point, a reception level of a wireless signal obtained by the access point search unit, and for defining, as the roaming start, when the reception level of the signal obtained by the access point search unit is a predetermined value or larger.

24. (previously presented): A mobile terminal according to claim 15, wherein the mobile terminal further includes:

a roaming start instruction unit for extracting an error ratio included in a beacon signal received from a connected parent station, that is an access point, and storing the error ratio, and for defining, as the roaming start, when the error ratio is larger than a predetermined error ratio.

25. (currently amended): A mobile terminal according to claim 15, wherein the access point search unit of the mobile terminal obtains the end time of a contention-free period, which are included in both a beacon signal and a probe response; and

wherein, the access point search unit searches for peripheral access points during a period except for a period where data are transmitted and received, after the contention-free period is over.

26. (previously presented): A mobile terminal according to claim 15, wherein the access point search unit of the mobile terminal comprises:

a passive scanner for receiving a beacon signal and for searching for an access point; and
a beacon table, in which the correlation between a wireless channel and a beacon transmission time is recorded,

wherein the passive scanner performs the passive scanning at the time recorded in the beacon table, excluding the time whereat the mobile terminal is transmitting and receiving data.

27. (previously presented): A mobile terminal according to claim 26, wherein the mobile terminal further comprises:

an active scanner for examining an access point from which a response is received relative to a search packet that the access point search unit has transmitted to the access point,

wherein, when the passive scanner fails to obtain the access point through passive scanning, the active scanner performs the active scanning.

28. (new): A fast roaming system according to claim 1, wherein the access point search unit obtains the access point data from the peripheral connectable access points.

29. (new): A mobile terminal according to claim 15, wherein the access point search unit obtains the access point data from the peripheral connectable access points.